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CARLSON, GASKEY & OLDS, P.C./Alcatel-Lucent
400 W MAPLE RD
SUITE 350
BIRMINGHAM, MI 48009

EXAMINER	
WONG, WARNER	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SUBRAMANIAN VASUDEVAN and YUNSONG YANG

Appeal 2009-007516
Application 10/001,296
Technology Center 2400

Before JOSEPH F. RUGGIERO, JOSEPH L. DIXON,
and MAHSHID D. SAADAT, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

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[1] The two month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304 or for filing a request for rehearing as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1-19, which constitute all the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Appellants' invention relates to a method for allocating the resources of a wireless communication base station amongst a plurality of wireless units. Data, voice, or the like are transmitted or received over a shared wireless channel by varying the transmission time span and/or bandwidth. A time span is an interval of time allocated by the base station to downlink a single information payload to a wireless unit. An information payload is a variable size block of information bits to be communicated by a base station to an active wireless unit at a given time. The entire information destined for the active wireless unit is parsed into a number of information payloads. The time span and bandwidth are functions of the channel quality of the wireless unit receiving the downlink transmission and the rate at which that channel quality is changing. Channel quality is the signal to noise ratio associated with the link between the base station and the wireless unit, taking into consideration any interference from other user's signals and background thermal noise, for example. (*See* Abstract; Spec. 4:2-16.)

Claim 1, which is illustrative of the invention, reads as follows:

> 1. A method of communicating over an air interface comprising:
>
> transmitting information over a shared wireless channel by varying a time span and at least one of a bandwidth and a duty cycle, wherein the time span is based on a rate of change in channel quality.

The Examiner relies on the following prior art in rejecting the claims:

Gitlin	US 6,018,528	Jan. 25, 2000
Hortensius	US 6,252,854 B1	Jun. 26, 2001

Claims 1-19 stand rejected under 35 U.S.C. § 103(a) as obvious over Gitlin in view of Hortensius.

Rather than repeat the arguments here, we make reference to the Briefs (App. Br. filed Apr. 24, 2008; Reply Br. filed Aug. 27, 2008) and the Answer (mailed Jun. 27, 2008) for the respective positions of Appellants and the Examiner. Only those arguments actually made by Appellants have been considered in this decision. Arguments that Appellants did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ISSUES

The issues presented by Appellants' arguments are:

1. Does the phrase "channel quality" as recited in claim 1 read on the bit-error-rate (BER) disclosed by Gitlin?

2. Does Gitlin disclose varying a time span based on the BER?

3. Is varying a time span based on a rate of change in channel quality obvious over Gitlin in view of Hortensius?

FINDINGS OF FACT (FF)

Gitlin

1. Gitlin discloses that the maximum number of users that can use a code division multiple access (CDMA) communication channel depends on the total amount of noise contributed by interfering users. Gitlin indicates that the level of interference that will exist within the medium

increases with the number of users simultaneously transmitting on the channel. (Col. 6, l. 66 – col. 7, l. 9.)

2. Gitlin discloses that the signal-to-interference ratio (S/I) determines the BER performance of the system (col. 7, ll. 9-11).

3. Gitlin discloses a channel use scheduling process in which user codes are granted so that the BER caused by the total level of interference from all the transmissions remains below an acceptable threshold (col. 8, ll. 42-45).

4. Gitlin discloses that to minimize code interference users are granted use of available code space for given periods in the time domain (col. 8, ll. 46-48; *see also* Figs. 5-7, 9, 10; Abstract).

5. Gitlin discloses allocating time-frequency slices so as to anticipate future requests which will be made by users (col. 4, l. 64 – col. 5, l. 1).

Hortensius

6. Hortensius discloses a wireless communication system (col. 1, ll. 22-24) in which a "RR[] [(repetition rate)] calculation procedure[] take[s] into consideration past and present measurements of link quality, age of the link quality measurements, speed of change in the link quality, packet types, packet lengths, received signal strength, and pattern and correlation in the link quality measurements" (col. 3, ll. 36-40).

7. Hortensius describes symbol error rate (SER) as a measure of link quality (col. 15, ll. 17-18).

8. Hortensius discloses that a next SER may be predicted by an equation (5) that includes $(SER_n\text{-}SER_{n\text{-}1})/(T_n\text{-}T_{n\text{-}1})$ as a term (col. 11, ll. 52-60).

Appellants' Specification

9. The Specification defines channel quality as "the signal to noise ratio associated with the link between the base station and the wireless unit, taking into consideration any interference from other user's signals and background thermal noise, for example" (Spec. 4:14-16.).

10. The Specification discloses that channel quality may be "at least one of a signal to noise ratio, a bit error rate, a frame error rate and a power loss of a wireless link . . . " (Spec. 19, claim 3 (original)).

PRINCIPLE OF LAW

> To justify combining reference teachings in support of a rejection it is not necessary that a device shown in one reference can be physically inserted into the device shown in the other. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.

In re Keller, 642 F.2d 413, 425 (CCPA 1981) (citations omitted).

ANALYSIS

Appellants contend that the Examiner has misconstrued Gitlin's disclosure (App. Br. 8-9).

The Examiner relies on Gitlin at column 7, lines 8-10, and column 8, lines 27-19, as describing an S/I which determines the BER to equate the BER to channel quality (Ans. 9). Appellants contend that Gitlin's BER is not to the same as the "channel quality" recited in claim 1 (*see* App. Br. 4-5,

8; Reply Br. 3). We agree with the Examiner. Gitlin discloses that simultaneous users of a channel will generate interfering noise (FF 1) that can be characterized by an S/I and that the S/I determines the BER of the signals (FF 2). Appellants have defined channel quality as comprising a signal-to-noise ratio, taking into consideration interference from other users' signals (FF 9, 10) (*compare* Gitlin's S/I), or as a BER (FF 10) (*compare* Gitlin's BER). Appellants' definition of "channel quality" expressly includes BER and S/I. We note that nothing in claim 1 specifies how channel quality is ascertained. Accordingly, we find that Gitlin's BER corresponds to "channel quality" as recited in claim 1.

The Examiner points to Gitlin at column 7, lines 8-10, and column 8, lines 27-19, as disclosing "varying a time span" based on BER (i.e., channel quality) (Ans. 9). Appellants assert "that nothing in *Gitlin* even remotely suggests varying a time span (regardless of how the Examiner interprets 'time span') based on the BER" (App. Br. 9; *see also* Reply Br. 1-2). We agree with the Examiner. Gitlin discloses channel use scheduling to keep BER (i.e., channel quality) within acceptable limits (FF 3, 4). We find that implicit in channel use *scheduling* is varying the time spans allocated to channel users and data packets, and that Gitlin explicitly discloses varying time spans allocated to users and data packets (FF 4). Furthermore, we find that varying time spans to keep BER within acceptable limits *is* basing the time span on BER. Accordingly, we find that Gitlin discloses varying a time span based on a channel quality.

Appellants argue that the combination of Hortensius with Gitlin "would change the principle of operation of the *Gitlin* reference" (App. Br. 4) and that such a combination "does not provide any benefit or usefulness

in the context of the *Gitlin* reference" (App. Br. 5). To the extent that Appellants rely on the meaning of "channel quality" or "varying a time span . . . based" on channel quality for this argument, we have addressed those contentions *supra*.

The Examiner relies on Hortensius for its disclosure of using a rate of change of a channel quality as a control parameter in a wireless communication system (*see* Ans. 9). The Examiner finds that "one of ordinary skill in the art can easily replace the measured value of 'change in channel quality' used in Gitlin with 'the rate of change in channel quality' used in Hortensius to result [in] better success in data transmission" (Ans. 8; *see* FF 6).

Appellants argue (App. Br. 5) that combining the rate of change in link quality of Hortensius with Gitlin's code-based scheduling technique would change Gitlin's principle of operation and not provide a workable result, because once Gitlin establishes a transmission schedule, it is unvarying. "The *Gitlin* schedule sets the BER within an acceptable level. Trying to vary a time span of one of the scheduled transmissions after a satisfactory schedule is already determined (based on a rate of change in BER or anything else for that matter) makes no sense whatsoever." (*Id.*; *see also* Reply Br. 2-3.)

We do not find this argument to be persuasive because Appellants do not point to any passage in Gitlin that would indicate that once the schedule is set, it is unvarying. As is implicit in the Examiner's analysis, we find that a person having ordinary skill in the art, reading Gitlin and Hortensius, would understand both as describing dynamic processes for adjusting signal transmission parameters to adapt to channel qualities which may change

with time. For emphasis, we note that Gitlin discloses anticipating future requests from users (FF 5), which will necessarily impact and change BER (i.e., channel quality), and requires changes to scheduling. Further, Hortensius discloses that rates of change in channel quality may be used to predict future values of channel quality (FF 7, 8).

Appellants further argue that combining Hortensius's RR selection with Gitlin's code-based scheduling technique would not yield a useful result (*see* App. Br. 5-6). As the Examiner correctly replies, "this is of piecemeal analysis since the [E]xaminer is merely using another measurement of 'a speed of change in the link quality' for the measurement used in Gitlin" (Ans. 9) and does not insert the Hortensius RR selection into Gitlin's scheduling method. *See Keller*, 642 F.2d at 425. Appellants provide no other rationale or evidence to support their contention.

Finally, Appellants allege impermissible hindsight based on the Examiner's use of the phrase "in view of" when suggesting a comparison of Gitlin's Figure 7 with Figure 2a of Appellants' application (Reply Br. 3-4; *see* Ans. 9). We find this assertion to be unpersuasive, as the Examiner's stated position merely indicates that the Examiner looked to Appellants' Specification and Drawings to understand the scope of the claims, which is not an exercise of impermissible hindsight.

We do not find any error in the Examiner's analysis and findings and, accordingly, sustain the rejection of claim 1, and of claims 2-19, which were argued together and fall with claim 1 (Br. 9).

ORDER

The decision of the Examiner to reject claims 1-19 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2010).

AFFIRMED

babc

CARLSON, GASKEY & OLDS, P.C./Alcatel-Lucent
400 W MAPLE RD
SUITE 350
BIRMINGHAM, MI 48009